

2013

# First Year Info Session

created and presented by UNSW physÔc

# Preamble

In case you haven't heard of physoc...

- Events
- Resources
- etc

<https://www.facebook.com/groups/unsw.physoc/>

<http://ugrad.phys.unsw.edu.au/physoc/>

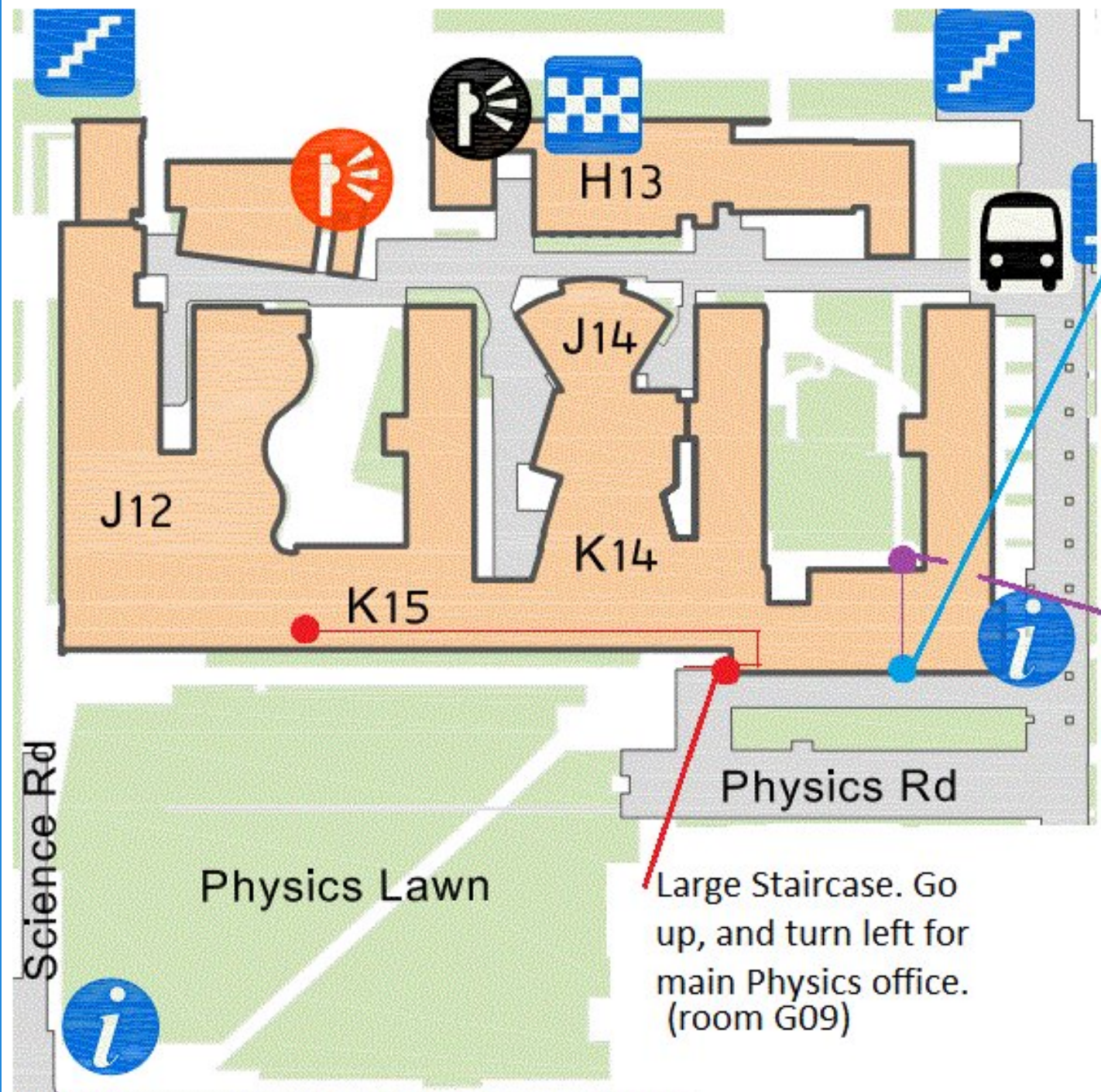
# Physoc Room

We also have a room where you can chill at!

## **Old Main Building RM LG35**

Amenities include:

- Fridge stocked w/ Drinks (\$1, honour system)
- Cosmic Background Microwave
- 5 iMacs (never all used simultaneously...)
- Lots of physics texts (literally stacks!)
- Past assignments/exams stash from a millennia
- toster(sic), kettle, sandwich maker
- whiteboard
- Desks, bed/couch, chess set...



Physoc Room.  
Go in through door that looks like a fire escape. It is the first door on your left.

(Alternatively, via Naked Lady Lawn, and it will be in front of you, on the right.)

Large Staircase. Go up, and turn left for main Physics office. (room G09)

Science Rd

Physics Rd

Physics Lawn

H13

J14

K14

K15

J12



# Agenda

- Specialisations
- How to use the Handbook
- Courses, prerequisites and advice
- Textbook recommendations and where to get them
- How to survive

# Specialisations/Research Areas

Astrophysics/Astronomy

Theoretical Physics

(Atomic physics, statistical physics, dynamical systems...)

Biophysics

Quantum Computing

Condensed Matter

Photonics/Optics

Music Acoustics (not taught, but see JWolfe)

etc

# Course Selection

[www.phys.unsw.edu.au/phys\\_current/syllabi.html](http://www.phys.unsw.edu.au/phys_current/syllabi.html)

Bookmarking it is useful in higher yrs  
Syllabus (sort of, and usually outdated)  
Most lecturers use this site (or their own) to  
upload lecture notes, assignments and past  
papers as opposed to Moodle/Blackboard.

[www.phys.unsw.edu.au/phys\\_current/re\\_enrolment.html](http://www.phys.unsw.edu.au/phys_current/re_enrolment.html)

Re-enrolment info (info on which courses are  
offered this year)

# Using the Handbook

Use handbook from year you started in regards to required subjects

www.handbook.unsw.edu.au/2013/index.html



**UNSW**  
AUSTRALIA

Handbook 2013

MyUNSW

Class Timetable

eLearning

Library

Contacts

## Handbook 2013

*your guide to degree programs and courses offered at UNSW*

[View Previous Handbook Editions](#)

UNSW Study Choices

**Undergraduate Study**

For:

- future UG students
- current UG students



**Postgraduate Coursework Study**

For students who:

- have completed a UG degree and are interested in PG coursework mode



SEARCH THE UNSW HANDBOOK

Quick Search

Select a Study Level and enter a word or phrase for the Program, Stream, Course or Specialisation you're looking for.

Study Level

Word / Phrase

Search



# Using the Handbook

Looking up your program and what courses you need to do to graduate

<http://www.handbook.unsw.edu.au/undergraduate/programs/2013/3970.html>

Change to the year you started in^

Looking up courses offered each year prior to enrolment

<http://www.handbook.unsw.edu.au/vbook2013/brCoursesBySubjectArea.jsp?studyArea=PHYS&StudyLevel=Undergraduate>

^Change to current year (should be default unless bookmarked/linked from outdated source)

Courses offered each year – [timetable.unsw.edu.au](http://timetable.unsw.edu.au) also works

Note: Information presented in the following slides is subject to changes. Please double check it before enrolling etc.

# Using the Handbook

## Plan Summary

**Faculty:** SCI - Faculty of Science  
**School:** School of Physics  
**Contact:** <http://www.phys.unsw.edu.au/>  
**Program:** 3972 - Advanced Science  
**Award(s):**  
Bachelor of Science (Advanced) (Major)

Look for 'physics' plan summary  
in your respective degree

## Plan Outline

Physics is the study of the laws of nature that govern the behaviour of the universe, from the smallest sub-atomic particles to the universe itself. It applies these laws to the solution of practical and theoretical problems and to the development of new technologies.

## Plan Structure

A major in Physics in Advanced Science programs is comprised of 90 units of credit of courses as follows:

### Stage 1

- PHYS1131 Higher Physics 1A (6 UOC)
- PHYS1231 Higher Physics 1B (6 UOC) or PHYS1241 Higher Physics 1B (Special) (6 UOC)
- MATH1131 Mathematics 1A (6 UOC) or MATH1141 Higher Mathematics 1A (6 UOC)
- MATH1231 Mathematics 1B (6 UOC) or MATH1241 Higher Mathematics 1B (6 UOC)

### Stage 2

- MATH2111 Higher Several Variable Calc (6 UOC)
- MATH2130 Higher Math Methods for DEs (3 UOC)
- MATH2620 Higher Complex Analysis (3 UOC)
- PHYS2110 Quantum Physics & Laboratory (6 UOC)
- PHYS2120 Mechanics and Computational (6 UOC)
- PHYS2210 Electromagnetism and Thermal (6 UOC)

These are the courses you want to  
be looking at for next year

### Stage 3

- PHYS3011 Quantum & Electrodynamics (6 UOC)
- PHYS3021 Statistical & Solid State (6 UOC)
- PHYS3031 Optics & Nuclear Physics (6 UOC)

PLUS 6 UOC from:

Note: This is a screenshot from 2012

# Course Selection - PHYS2x Core

PHYS2110 (Sem1) Quantum Mechanics and Lab

PHYS2210 (Sem2) Electromagnetism and Thermal Physics

# Course Selection - PHYS Electives

Most Elective courses are offered in second semester, but not all run every year. So next year might be the year you have to do them. Depending on prerequisites, you are able to do most 3rd year electives (PHYS3X) in second year.

# Course Selection - PHYS2x Electives

## **EVERY Year**

PHYS2120 (Sem1) Mechanics and  
Computational Physics

- *Compulsory for Advanced Science students*

PHYS2160 Astronomy

PHYS2410 Biophysics

PHYS2630 Electronics

PHYS2801 Atmospheric Science

# Course Selection - PHYS3x Electives

**EVERY Year cont.**

PHYS3550 General Relativity (Sem1)

PHYS3040/3070/3110 Experimental Physics

PHYS3770 Lasers and Spectroscopy Lab

PHYS3780 Photonics Lab

# Course Selection - PHYS3 Elective

## **EVEN Years (Next Year)**

PHYS3720 Optoelectronics (Sem1)

PHYS3410 Biophysics 2

PHYS3510 Adv. Mechanics, Fields and Chaos

PHYS3160 Astrophysics (Honours Elective)

# Course Selection - PHYS3 Elective

## **ODD Years**

PHYS3610 Computational Physics

PHYS3170 Cosmology and the Interstellar  
Medium (Honours Elective)

PHYS3710 Lasers and Applications (Sem1)



# Course Selection - MATH2x Core

MATH2011/2111 (Sem1, 6UOC, Core)

Several Variable Calculus

\* MATH2121/2221 in 2014 (Sem2, 6OUC, Core)

Mathematical Methods for Differential Equations

*formerly MATH2120/2130 (3UOC)*

\*MATH2521/2621 (Sem2, 6UOC, optional)

Complex Analysis

*formerly MATH2520/2620 (3UOC, was core for Adv.)*

**NB follow 2014 handbook for maths even if you started in 2013.**

# Course Selection - More options

MATH2801/2901 (Sem1) Theory of Statistics

MATH2501/2601 (Sem2) Linear Algebra - used in QM

## Other Useful Courses/Subjects?

See other maths courses e.g. Discrete, 3rd yr courses at <http://www.maths.unsw.edu.au/currentstudents/course-homepages>

Computing courses useful for astrophysics/theory. Not strictly necessary (can learn on job/ comp phys courses). <https://wiki.cse.unsw.edu.au/info/COMP1917>

Double majors possible - Maths or Chem are common.

# Course Selection - Higher Maths?

Higher maths courses tend to cover significantly more abstract materials and focus on proofs as opposed to calculations as in lower courses.

Higher level maths is required for Advanced Sci students. They are recommended and encouraged for those interested in Mathematical/theoretical physics but not strictly necessary.

# Administrative Help

Sue Hagon (“Physics Friend”) is the go-to person for any administrative issues you come across, including:

- Timetable clashes
- Confusion with courses (when/which ones)
- Anything else

If she isn't able to help you, she can point you to someone who is.

Prof Gary Morriss is the Undergraduate Director

# Timetabling Issues

Physics is notorious for clashes.

Fill in 'clash approval form' from the science student office/Sue Hagon

- Physics courses: talk to Sue Hagon
- Maths courses: student office in red centre
- Other: contact lecturer/school office (This can be done via email)

In most circumstances, you will only be allowed one hour of clashing subjects - however, exceptions can be made.

# Combined Degree Issues

Doing a Combined degree (now called dual degree)? Well, I hope you like clashes.

Engineering: You probably won't be able to stick to the recommended plan well (or at all). You'll need to talk to both Sue and the Engineering school office to work something out and hope for the best.

# Research Projects: 2nd year and beyond

You can take research projects during the summer at UNSW by applying for a “summer vacation scholarship”: Faculty of Science or School of Physics

Great opportunities to learn about research, very fun and \$. Talk to your lecturers or researchers.

Other opportunities available: in semester such as PHYS4200

Other uni's/institutions, companies, govt orgs also offer such positions: eg AAO, DSTO, CSIRO etc

# Textbooks - Suggestions

## General/ First-Year:

- Feynmann Lectures on Physics
- Serway & Jewitt, Physics for Scientists and Engineers
- Halliday - outdated, but useful problems

## Quantum and Electromagnetism:

- Eisberg & Resnick, Quantum Physics of Atoms, Molecules, Solids, Nuclei and Particles (2nd Yr)
- Griffiths, Introduction to Quantum Mechanics and Introduction to Electrodynamics (3rd Yr)
- Gasiorowicz, Quantum Physics (3rd Yr)
- Landau & Lifshitz (very advanced)



# Textbooks - Suggestions cont.

## Mechanics:

- Fowles, Analytical Mechanics (2nd Yr)\*
- Goldstein, Classical Mechanics (3rd Yr)\*
- Landau & Lifshitz series (very advanced)
- Morin, Introduction to Classical Mechanics
- Hand and Finch, Analytical Mechanics (2nd-3rd Yr. Good supplement to Goldstein)

## Chaos:

- Sprott, Chaos and Time Series Analysis (3rd Yr chaos)
- E. Ott, Chaos in Dynamical Systems (3rd Yr Chaos)
- Devaney, A First Course In Chaotic Dynamical System (Theory and Experiment) (3rd Yr Chaos)

# Recommended Texts - Ctd

Thermal Physics/ Statistical Physics:

- Carter, Classical and Statistical Thermodynamics  
(Curmi/Gary's reference for both courses)
- P.M. Morse, Thermal Physics
  
- Schutz, General Relativity

And lots more. Talk to us

# Textbooks - Where to buy?

Online:

## Abebooks

- often very cheap
- can possibly save on shipping by bulk buying with friends
- international copies are same, much cheaper but lower quality.

[booko.com.au](http://booko.com.au) - use this site to compare prices across other sites.

# Textbooks - Too lazy to buy?

Main library (Level 6) has a large collection

It is also possible to download pdf copies of some textbooks onto devices. Links may be available on physoc.

**[Physoc does not condone illegal downloading.]**

# How to Survive

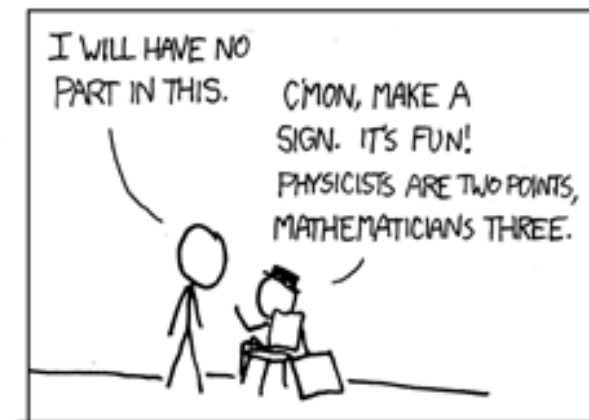
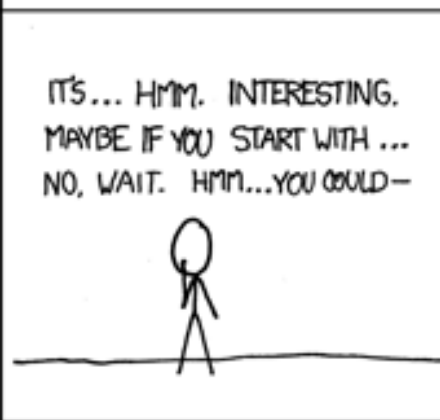
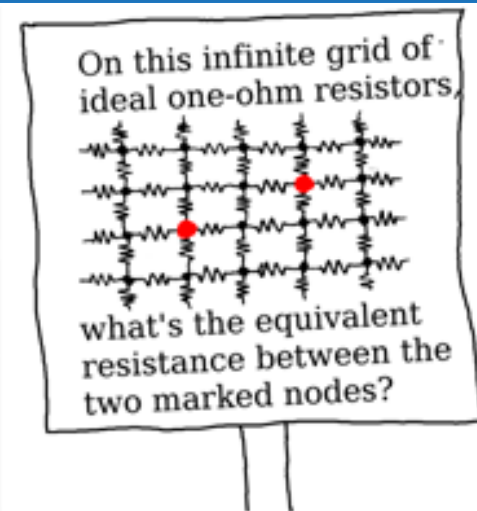
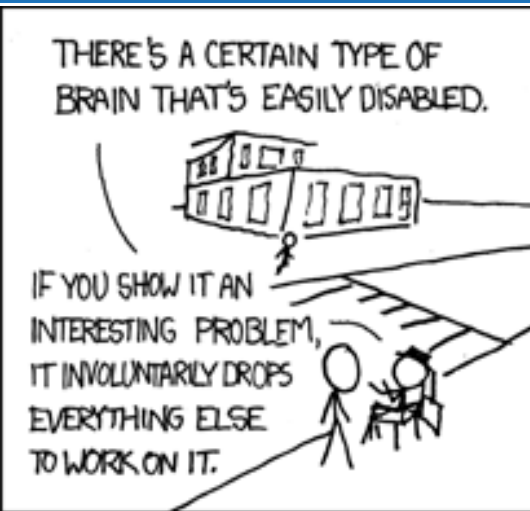
Create a facebook group for your year. Good place to procrastinate/discuss assignments/complain.

Talk to higher years, honours students, postgrads.

Physicists are friendly and approachable :)

They are a great source of assignment help, general advice, and fountains of wisdom.

# How to Survive cont.



# Any Questions?

We don't bite. Feel free to ask us after, or stalk us down on fb, email us, at any time!

# The End

Good Luck with your studies!